

US FISH AND WILDLIFE SERVICE
INTERVIEW WITH DR MILTON B. TRAUTMAN
INTERVIEWER Michael Smith
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“Audio Cassette Dub from Reel-to-Reel”

INTERVIEWER: This will not be used in the radio series it's just for my information.

DR. TRAUTMAN: Okay.

INTERVIEWER: This idea of the trees serving to insulate, in effect, the atmosphere around the streams, did they not also have something: I guess in Kentucky we would call it the “clear rise”. There could be a heavy downpour but there would only be slight discoloration of the water, and the water wouldn't even come up that much, because the earth was so absorbent.

DR. TRAUTMAN: That's a point. It was a foot or more of the leaf mold. That was a sponge.

INTERVIEWER: It had greater stability for the stream [unintelligible]

DR. TRAUTMAN: You see, in those days: Well in the first place, when the leaves were out, the raindrops in June were supposed to be the biggest raindrops of any time of the year. When the hard storms would come, they would hit the leaves, the fall of the raindrop would be broken and they would hit the mulch and sink in gradually and be absorbed. But the moment they chopped those trees down, the sun dried that mulch out and when the rainstorms came those large raindrops hit the mulch and just took it right down into the creek.

INTERVIEWER: And when the mulch is gone, there is nothing but dirt.

DR. TRAUTMAN: Then it began to erode the clays. Sure.

INTERVIEWER: The clay would seal with the rain, but there would be clay particles washed in causing yellowing in the stream.

DR. TRAUTMAN: And as you know, every stream, the Indians named from some physical characteristic. Up on Tangie River was a fish peg creek because they went up to Minnetek Springs for their red oxides for war paint. There is only one stream that I know of that was referred to as “The Eroding Banks” and that was [unintelligible Indian name]. Which is the Youghniogheny. If you look, the Youghniogheny, at one point at least, where the banks are eroding, and always have. They are just so steep, and the ground is so pliable and slippery over the shale that a forest just never had a chance to get there.

INTERVIEWER: Um-hum. If we could talk a little now, as far as stream habitat regarding Big Darby Creek. Big Darby rises in a glacial part of Ohio.

MR. TRAUTMAN: That's right.

INTERVIEWER: And it flows down to either non-glaciated or a border glaciated area.

DR. TRAUTMAN: No, it's all glaciated area. It starts in the Moraino part of Ohio. It's a sag and swell type of topography, under-laid with gravel. This means a lot of streams, and it's a fairly low gradient.

INTERVIEWER: Would this have been what you would call a prairie-type stream at one time?

DR. TRAUTMAN: It was almost definitely a prairie-type stream. And even those little tributaries that come in. For instance, at we started at [unintelligible]

INTERVIEWER: What about Red Finned Pickerel and some of the others?

DR. TRAUTMAN: It's gone back to the name Grant's Pickerel now.

INTERVIEWER: Oh, Grant's Pickerel. Big Darby also has a population complex that would be more closely related to some of the southern Ohio hill country streams.

DR. TRAUTMAN: Well, it starts out, you see, up north with these very clear streams like Creek Chub, Blacknosed Dace, Yellow sided Dace, things like that. It goes on down to the Ohio River [gives Indian name Scioto River], a large buffalo carp-sucker complex. You see, on my ripple which is on Route 104: By the way, if you want to see that, we could drive down and look at it, if you have the time. I have my car here. But I have taken over one hundred species of fishes out of Big Darby Creek, which is the finest indication of the diversity of that creek which is possible. This is one of the reasons that it should be preserved and not dammed. As a free-flowing stream, I am confident that such things as [gives Latin name of a fish] comes from as far south as the Ohio River, up the Scioto River and into Big Darby to spawn.

INTERVIEWER: Would that be in March or April?

DR. TRAUTMAN: March or April, that's right. And you never catch them in summer.

INTERVIEWER: That, to me, is a major spawning effort. I mean, from the Ohio River, all the way up the Scioto River!

DR. TRAUTMAN: Well look, they call Illinois "the sucker state" and Missouri "the sucker state", and the reason was, was that they came out of the Mississippi and the Ohio in untold millions of spawn! Crickman speaks about standing on a high hill overlooking the Cuyahoga and seeing a dark streak in the water, more than four feet wide, and on every ripple, almost, that he could see, there was a farmer with a spear, spearing bass, walleyes, muskellunge, pike and small-mouthed bass that were going upstream to spawn.

I have had farmers tell me, way up in Ottawa County, that in streams twelve feet wide, about having their spears on their plows in spring. They would hear these great sturgeon breach, jump up in the air and fall down on their bellies. They would go down there, and there would be a sturgeon spawning there that was as almost as long as the stream was wide. They would spear it and they usually had about three barrels of salted sturgeon a year. They came up and all they did was cut. They put one dam across the river and you've stopped all of that. It was the tributaries of Lake Erie that produced the great fish populations there, of most species. Principally, such things as the sturgeons, the muskellunges, the pike, small-mouthed bass, and even the walleyes went up in great numbers.

INTERVIEWER: Well now, getting back to Big Darby Creek: This is a stream that does not have any high dams on it now, are there any low ones?

DR. TRAUTMAN: No. Well, there may be but there is nothing there but what a fish couldn't get up in the spring in high water.

INTERVIEWER: Has the water quality, let's say in the last twenty-five or thirty years, just as measured by simple clarity that an average observer could tell, has is changed?

DR. TRAUTMAN: Well, down in New Orleans, once, I gave a paper, as I always did on my ripple, I pointed out that the populations varied in direct ratio with the price of corn. And that set some of these people who never get out of a museum on their ears. And I pointed out that this is logical: the higher the price of corn, the more they plowed, the more they cultivated in corn land. The more the more silt came in. And I pointed out too, that I have watched a man, in a twenty-minute rainstorm. He had been plowing before the rainstorm. And I watched this clay just running into the Big Darby up above the farming ripple that I was watching. The clay flowed in there like soup almost it was so thick. And it killed seemed to have killed every sucker in that stream, except the [Latin names of three fish], they just died, right now! You see, their mouths are undershot. Unlike a bass, they can't open their mouths wide, and clean their gills. The gill flaps can't be extended outward because they are bound to the isthmus. The result was they just took this mud on their gills and when you opened the gill chamber, it was just a mass of mucus and clay. Of course they suffocated, completely. I picked up hundreds of them one day.

INTERVIEWER: Does Big Darby have a fairly stable stream channel? And does it meander a little bit from year to year, creating new ripple areas?

DR. TRAUTMAN: Every stream in the world has got to do this. Otherwise they wouldn't make a valley. This is a normal thing for a stream, to meander back and forth. I can take you down there and show you a [Latin name], a Cottonwood, that is two feet in diameter which in about 1928 was the main ripple of Big Darby Creek. I have taken, and still have in the museum, a specimen Darter from underneath that tree, which of course wasn't there. Then, I can show you a field that is now a cornfield that was a cornfield then. But five years later it was a gravel pit for ten years. I can also show you where I

first caught the Tippecanoe darter. It's now off of the side of an oxbow that hasn't any water in it at all.

INTERVIEWER: If we could talk just a moment about the type of vegetation that occurs along the stream: A common site this time of year, I'm sure, would be the sycamore.

DR. TRAUTMAN: Yes, the sycamore is one of the dominant ones in the lower portion of course. And much of the river course is in a soft maple. Of course the elm is practically gone now. I think that taking its place is the Pioneer Reed tree. I don't remember fifty years ago, the vast number of box elders that are occurring now. This is a tree that can really withstand any amount of punishment. It grows very fast, but it is short-lived. I don't think there are as many Willows as there used to be. There is no such thing as hemlock along the stream or any of those northern things. And there are no river birch either.

INTERVIEWER: Speaking of right on the waters edge, in my experience, one of the most common green sites along the stream in summer is what we called "water wheel", I think it's *Diamthera*.

DR. TRAUTMAN: Yes, it's called *Diamthera Americana*. And in the past ten years it's called simply *Tisica Americana*. It occurs only in limestone or a limestone or alkaline stream. It loves to grow in a crack between limestone.

INTERVIEWER: I heard that it is associated with good rock bass fishing.

DR. TRAUTMAN: That's the finest Rock Bass fishing. And it is the same that because of the type of stream with the bedrock, it has "step-offs". Underneath those "step-offs" you can get your Rock Bass. This was one of the demonstration areas. I said, "Now boys, you haven't got many Rock Bass. Now you just watch me". I would up to one of those "step-offs", in winter, and I'd kick up through the leaves, and up come the coal black Rock Bass. They didn't recognize them as rock bass because they were coal black.

INTERVIEWER: They were in hibernation.

DR. TRAUTMAN: That's right, they were in hibernation. I used to get great big ones up there in winter. And so I have said, that that is one of the least migratory of all of the fishes in Ohio, which as a general rule with a few exceptions, are more or less highly migratory.

INTERVIEWER: Does Big Darby Creek have, you mentioned more than one hundred species of fish, what about the invertebrate population? Specifically mayflies and things like that.

DR. TRAUTMAN: It used to be one of the finest streams for "conniption bugs". And it used to have an abundance of mayfly larvae. It was just a wonderful stream in that respect. But again, it isn't as good as it was. And this is probably because of the silt

coming down. It goes underneath the places where the darters, and invertebrates live and destroys their habitats.

INTERVIEWER: Have agricultural pesticides and herbicides, to your knowledge, had any effect on the vertebrate and invertebrate life on Big Darby Creek?

DR. TRAUTMAN: Oh, it must have! I'll tell you, in 1920 to 1930, when I would fly-fish that stream once a week from 4:00pm until about midnight. I have been on that stream. When I would fly fish, and it was sixty feet wide, so I couldn't see the other side, for a hatch of mayflies. That hatch didn't last long, only for two or three nights. But it was just as stupendous as the one we had on South Bass Island. Where they would haul four or five, ten ton truckloads a day away. When my line would swish through these [unintelligible] you would just see a steady stream of wounded things drop, and the first thing you know, there's all of the minnows in the world feeding on those mayflies. And then, the first thing you know, you'd see a bass swirling. That's how you could get your bass. But I haven't seen that in the past fifteen years.

INTERVIEWER: Compared to other streams in central Ohio, Big Darby is still, even though there has been a lot of environmental decline, still one of the better streams?

DR. TRAUTMAN: I would say, that taken by and large, for the diversity of habitat, the number of species, and for the relatively undisturbed condition, it unquestionably is, I believe, the finest stream in the state of Ohio. [Unintelligible] Creek was also good, but now they are ruining it.

INTERVIEWER: How could a stream like Big Darby Creek be restored and enhanced? Could it be brought back to its former abundance?

DR. TRAUTMAN: By education of the people, and keeping cities away from it if possible. Especially building down. The gradient is such, and it is prairie soil, that if agriculture was not extreme and if there is a little care taken in plowing. And no winter plowing, as is the fashion nowadays. This winter plowing removes more topsoil than anything I know. This should be stopped by law. I don't believe that a human being has the right to destroy land so that future people are going to starve. I don't think that should be allowed just to make another fast dollar. I think that by taking care of that stream you could make it a showplace for all time, just as it is a showplace now. I have seen people come from as far away as Oklahoma to see that stream. We have a dozen colleges and universities taking their classes there to show them what a stream in Ohio looked like. We've got a big impoundment or reservoir on every other central Ohio stream, why can't we have one stream, which is allowed to be free flowing? Why can't we have that to show people? Especially at this time when we don't need another surface reservoir!

INTERVIEWER: If we could talk for a few moments about the Siota Madtong [sic]. I'll just start you off here, and ask the question: How did it come about? If you could describe the first time you collected and then give a description.

DR. TRAUTMAN: Well, this ripple, the Siota Mad tong [?] is a place where we have taken seventeen or nineteen specimen. It was virtually no bigger than this small room. I had been seeing the area from 1922 to 1946, I believe, somewhere in there. You can find it in The Fishes of Ohio, and never taken one. I needed to get some varying darter color descriptions for the fish book. So I went down there with a man named Cunningham, and all of a sudden he caught two specimens of [unintelligible name]. And I couldn't tell if it was [unintelligible]. I said, "Now something has happened here". I put them in a jar and I was so busy working on the fish book that I hadn't too much time going to study them. Mary and I went down there about the twenty-eighth of December. She stood in a two-foot snow bank and the temperature was hovering around zero. I went out in the ripple, the pools had about six inches of ice on them, but the ripples were open. I took my seine [sic], which froze as I brought it up. I was catching darters for color descriptions. I was working in November and December on the darters. Up came one of these, and I had been throwing these Darters over into the snow. And when they hit the snow, the cold just brought out the color magnificently. Mary dumped them in a cooler, and they retained their color. And when we got home, where it was warm, and she could write, she usually took about three big tablet sheets for each species. I said, "Here is one of those funny looking catfish". I decided not to throw it. I took and put it in a bottle. It got me interested. I thought that I would take time out and study that thing, and I couldn't compare it to anything. And I said to Mary, "This thing looks like a new species, but I just don't have time to do anything with it". Well then, William Ralph Taylor, I had heard, was going to monograph the genus [unintelligible], which he rightly called the "Touris" [?]. He asked for much of my material. I sent him up hundreds of specimens, including these and I didn't say anything to him. I wanted to see if he saw something funny about that. And he came back and said, "I can't identify this thing". And this is the way it happened. Had I had the time, I would have described it of course, but I was too busy with other things.

INTERVIEWER: The Latin specific name bears your name "Noturis Trautmani" that was named in honor of you because you were the first to discover it.

DR. TRAUTMAN: Yes. Normally there is such a thing as professional etiquette. If you collect an undescribed species, and somebody is going to monograph that species, if you've got that species ready to describe, which I didn't have, why you described it and he would include it in his monographic revision. But I didn't have it ready for description. I turned it over to him. Then he described it. Well, professional etiquette almost makes a person. Name it after the fellow that gave him the first specimen, and this is what happened.

INTERVIEWER: If we can talk a little bit about Trautman's Ripple, about the only known or proven habitat of the Siota Madtom [Latin name of a fish] how large is the ripple in total area? One hundred or two hundred feet wide?

DR. TRAUTMAN: It's actually a complex of four ripples, above a dam. And these things keep changing. For instance, in the old days, ripple number one was the best. And

then ripple number two, and then three, and then ripple number four were best. It then started back at number one again, and went back to number four. Ripple number four is the thing on which these things were taken. Within the last two years, ripple number five is appearing upstream. There is enough gradient to have five of these ripples now, in a series. But the point was, that that thing was taken in the foot of the ripple where the current would begin to slow down, where it was one to three feet in depth. And where there was coarse gravel, maybe a quarter of an inch in diameter, to fine sand. One year there was a good crop year, and Don Mount, who now works for the federal government and is a director up at the Luce Station for the Fish and Wildlife Service, he was a student then working on the Blue Breasted Darter. I would go down and help him primarily, but not only to help him, but also to see if we could catch this thing, and we caught most of them in that one-year. Then, in 1960 I had a stream survey. I had the nicest group of students I have ever had. They were so wildly enthusiastic, it was sometimes pathetic, and we just seined the living daylights out of that stream, and we never got a one! We would start ten miles upstream, and then come down. I have a theory that possibly we don't know as much about the upper reaches of Big Darby as we do about the lower reaches, around my ripple. I have a theory that this thing migrates far upstream somewhere to spawn and we haven't found that spawning area yet. When the creek gets low as it does in extreme droughts, like in 1930 when the ripple was only about five feet wide, why, these things have to come down there. That's why a dam would decrease the possibility of survival of this species. Because if it spawns upstream, and came downstream, now we know that fish will do this, beyond any question of a doubt. Bruce May, a student of mine, who got his masters degree on [Latin name of a fish]. He tagged some on my ripple, which were caught eight miles north, up at the headwaters, as far as they went.

INTERVIEWER: Are there any small spring-branch tributaries to Big Darby Creek?

DR. TRAUTMAN: There are a number of them. And they are not spring-branches any more.

INTERVIEWER: Just surface runoff?

DR. TRAUTMAN: Just surface runoff. They have to be, because everything is tiled. As soon as that water hits a field, it washes into the creek or soaks down a foot, gets into a tile, and off into the river it goes. That is why we have this ever-increasing differential between high floods, and droughts. Now, the ultimate is when a stream is channelized. This makes a straight shoot, and the water just flows right down there as it would in a gutter. And it would last as long as it does in a gutter. As soon as the rain is over, the gutter dries up again.

INTERVIEWER: And of course, with increased velocity, there is increased destruction of in-stream habitat.

DR. TRAUTMAN: That's right.

INTERVIEWER: Now on the Siota Madtom: What have you been able to learn, or discover about its food habits, it's daily activity?

DR. TRAUTMAN: Well, we haven't caught enough to do that. I know that we have fished for it from one midnight to another midnight, in temperatures below zero, to temperatures above ninety, and the only time we've caught it have been September through December, and at this place. This indicates that for the rest of the year, it is probably further upstream. This is another reason why we believe the stream should be left free flowing.

INTERVIEWER: Is it possible that it would be seeking out the same type of habitat upstream in spring and early summer? Or could it perhaps be a bottom of the pool type dweller?

DR. TRAUTMAN: Fishes of course, usually spawn in higher gradients, in which they normally lay out. I would say that this little thing, like its closest associates, lays a glob of eggs underneath a stone, in a crayfish hole, or among roots, or something like that. But we have never found that nesting habitat. We found the nesting habitat of all of the others.

INTERVIEWER: I am just speculating now, is it possible now, with the decline in habitat, perhaps the Siota Madtom has been exposed to a degree of greater predation by perhaps stream fish or common water snakes or something of that nature. Could it be at that critical area where normally predation will not hurt any given species? But if its habitat is so destroyed, would it be more vulnerable to it?

DR. TRAUTMAN: Of course. As I pointed out in past conversations, I didn't believe that the commercial cropping of Lake Erie fisheries had any effect on those fishes at all, as long as the habitat is sufficient, and available. But as soon as the habitat was destroyed, the predation became critical. Well, this is true of any species. For instance, the whooping crane, if there are only forty of them there, and you take ten of them out, you have seriously depleted that endangered population. But if you've got four thousand of them, and you take ten out, or even one hundred, you haven't the same detrimental effect.

INTERVIEWER: Dr. Trautman, if we could now, I'd like to ask you some opinion questions. Some people who are not familiar with natural science, or do not care about the natural world, they could counter with the question, "Why should we try to save this one small species of Madtom, what's the worth of it?" Are there several ways that you could answer that?

DR. TRAUTMAN: Well, that's ninety-nine percent of the population. Yes, there are several ways, but the most logical one is to admit that this thing has no economic importance. But, that we have as a nation, exploited all of our natural resources, some to a very great degree. We have killed off the passenger pigeon, the Carolina parakeet, and other animals like that. Also the red wolf, and other small animals. The time has come I

believe that this has got to cease, if we want to save our natural environment. And I can think of no better place to start, than on this little catfish.

INTERVIEWER: Dr. Trautman, once again, many people would counter: "What good is the natural environment? We are creating an environment of man, cities, suburban areas, shopping centers and shopping malls." How would you reply to that?

DR. TRAUTMAN: I would suggest that you read some of these papers on agronomy. And note the fear that some of the men feel that we are getting ourselves into by hybrid corn and getting the genetic population very low so that if one gene goes out, you are in trouble. For instance, in the southern United States we had a corn shortage because of a bacteria or something. And it just took it out. Well, it used to be that we could go down to Mexico and get all sorts of strains of corn, and bring them back and revitalize our corn. For instance, I live with five hundred feet of the Park of Roses. I received as a small boy, when I was six years old, an ever-blooming rose. It bloomed throughout the summer. I lived down in the southern part of Columbus. [Ohio] And when I moved to the northern part of Columbus in 1955 I brought that up there, and it just did beautifully. It just kept blooming. It didn't bloom as massively as they did at the Park of Roses as other new varieties had. But up there, they were having trouble with "black rot" and everything under the sun. They had to spray and spray, and spray. Our neighbor got two hundred and fifty dollars worth of roses, and they couldn't take a vacation. They had to stay home and spray those roses every other day. And there was my rose, within fifty feet of them, and it was not affected at all. In other words, we have got to learn that we cannot do this sort of thing to our food. The first thing you know, we are going to find ourselves out of corn or wheat. Right now we are having trouble keeping up with Wheat rust. As soon as we conquer one type of "wheat rust", another one comes in. What we have to do now, in the next one hundred years is raise things, maybe making not as much money as we did before, but that are more dependable, and don't leach the soil like our plants do now.

INTERVIEWER: If I could ask you about genetic uniqueness of the Siota Madtom[sp?]
Is this a fairly new species in the evolutionary sense?

DR. TRAUTMAN: I couldn't answer that. It's probably an old species. A species normally starts with one homogeneous population. Then it splits up into two or more populations. If one of those populations becomes sufficiently isolated by one or many factors, it becomes its own species. If it lasts long enough, it gets a genetic immunity and if it hybridizes with anything close, why, the young will probably not develop. Or they might develop all in one sex or some other sexual variances. This new species is just like a youngster, it grows by leaps and bounds. Then it gets to maturity, it reaches twenty-one, after so many centuries, or thousands of centuries, and then it has a period of maturity. Then it starts out into senility and old age. The older it gets, the less plastic it becomes, and it's ability to change with its environment decreases. A species that has lived as long as for instance, the whooping crane: A whooping crane today, would probably not recognize the habitat that a whooping crane lived in maybe five hundred thousand years ago. The whole habitat has changed in America since then, but stopped at a sufficiently slow rate of speed. So that the Crane could modify itself, and take

advantage of and incorporate this new environment. I believe thoroughly that the passenger pigeon could have survived if we'd have given it a chance to readjust itself, like we did the pileated woodpecker and several other species.

INTERVIEWER: Considering the massive environmental changes wrought upon Big Darby Creek in the past one hundred and fifty years: considering the change from a natural prairie-land, grass-land stream, to the first rush of agricultural expansion in Ohio, now, to a later onslaught in the twentieth century of more deforestation and more intensive agriculture; if it does still exist and perhaps in fair numbers would this indicate a measure of plasticity on the part of the Madtom? Perhaps it is trying to adapt?

DR. TRAUTMAN: I do think so. You started out by asking if it was a rather new species. I would say that it is a very, very old species. And therefore it is difficult for it to survive in changes. Just as we believe that [unintelligible] warbler is a most primitive of species.

INTERVIEWER: If the Siota Madtom could be collected again in sufficient numbers, do you think it would be possible to perhaps attempt captive breeding of the Madtom?

DR. TRAUTMAN: There is no doubt in my mind. Doug Mount kept two specimens for a year in a small aquarium. They didn't breed. It looked like they might, but apparently we didn't have the habitat for them to breed in. We watched them and watched them and watched them. But there is no doubt that if you caught those little fellows you could do it. In the first place, I have never seen a mature adult. Maybe a mature adult is five inches long? All I've seen are those that are less than three inches long.

INTERVIEWER: Is there a possibility that perhaps some isolated pockets or very small populations may yet exist in neighboring stream branches, perhaps Little Darby Creek?

DR. TRAUTMAN: Well if there are, we've seined and seined, and seined and never taken one. We have seined some of those streams, Big Walnut for instance, fully as hard as we have seined since 1897, as we have seined Big Darby Creek.

INTERVIEWER: Before I ask this question, I would like to make an observation: I have several friends still in Ohio, many of whom are sport fishermen. They enjoy fishing streams. But they are of the mind that if it rains the stream will be muddy, and indeed, they are right, in this State. But it is also in their minds that it has always been this way. They cannot accept the fact that at one time there could be a rain, and there could still be a clear stream.

DR. TRAUTMAN: All right, I will counter that as I did in this lecture at the Laboratory a week ago. I pointed out that the Maumee River was undoubtedly, from the literature, one of the clearest streams in North America. I cannot imagine a stream so clear. The gradient was low. It flowed through lake slits, it sifted out the sand, and it was virtually all sand. Time and again the literature talks about the seas of grass in the Maumee and its tributaries. The land was tied down, and the gradient was low. You think of a prairie

as not being tied down. But you've got to realize that sometimes these big tree stands are several hundred years old. Somebody took the time to count or add up the length of the roots that are on one of those big plants, and it went about three miles. Well now, they held down the soil. In fact, it was held down so well that they couldn't really plow with horses. They had to use oxen to plow. But once they plowed down those fine lake slits of Lake Witelsee, it just simply poured right into that lake. The slit covered up the leaves of the aquatic plants, cut out the light, and they died out. There was a change, and the most drastic illustration of that change is that there were at least fifteen species of fishes that were there before 1900, which today are not there. One of them is extinct, the [Latin name of a fish], the Hair lipped Sucker. I went back to a place that Phillip Kirsch in August of 1893 or 1894 had pointed out. He pointed out a place one hundred feet or so below a railroad trestle which had just been installed. Robert Foster and I went there, and we took a pick and shovel. We measured out the distance, and dug right down and we had to go over one and a half feet through silt. And suddenly just like that, there was the sand that Kirsch spoke about, and the blue clay that he spoke about. We went down beneath those and could still see the blackened roots of the aquatic vegetation. The important part of that was, that this silting happened all at once. Here it was, this beautiful sand, as he spoke about, and this is where he caught, at that locality about one hundred of these now extinct suckers. Just in one year, it became silt-laden, of course it did. Somebody plowed along the stream, and the slit began to pour in and cover that up, just as if you poured muddy water with a lot of silt in it on this floor and let it settle.

INTERVIEWER: The layer would be that clean?

DR. TRAUTMAN: It would have that sharp of a cut. When you looked at the vertical edge, it gets stopped instantly. The sand stops and the silt begins. It wasn't a matter of ten years.

INTERVIEWER: Getting back to Big Darby Creek for a moment: You told me that there has been environmental decline. Is the stream bed essentially the same, even though there had been a built of clay-type slits, is the rock structure pretty much the same, or has that been washed and gouged out too from flash flooding?

DR. TRAUTMAN: Well, this is the way a stream has to act. It's got to wash out. It's got to dig a channel. Otherwise it could never have a valley. It moves back and forth through the centuries in this valley.

INTERVIEWER: I was wondering if perhaps, my point here being, that with increased agriculture, and increased periods of runoff, if perhaps the whole aging process of that stream has been accelerated?

DR. TRAUTMAN: I have no doubt of it. With the removal of the forests, of course you have increased erosion. With the plowing that we have, of course there is. But after all, that's the best thing we've got left. And therefore, it should be saved. This is my whole thesis.

INTERVIEWER: The Siota Madtom: Is it closely related to any of the other Madtoms that still occur in Ohio?

DR. TRAUTMAN: Oh yes! Not in Ohio, as much as in the Green River, in Kentucky. There is one there that apparently came off from this one, comparatively recently, maybe a couple of hundred thousand years ago. But the two are definitely distinct.

INTERVIEWER: How many species of Madtoms occur in Big Darby? Are there three or two?

DR. TRAUTMAN: Well, there is Naturis Flavus, there used to be Naturis Luthirus, and there still is Naturis Sphigmosis, it used to be called Ptereiosus. And then was a tadpole Madtom, called Juranis. So there are at least four, and I am sure that there was a fifth one, a Lutherus, I know of all of these, and Miaoris.

INTERVIEWER: Did they all have their own distinct habitats within?

DR. TRAUTMAN: They are just as distinct as they possibly can be. In some species there seemed to me more competition than there was in others. For instance, the Flavus likes big rocks that are flat which to spawn under. The Juranis loved to spawn under the roots of an undercut bank, in the dark, in there. Apparently Juranis prefers a crayfish hole, as did others. A Miaoris will go in a crayfish hole. A Lutherus and an Sphigmosis liked faster water in the ripples under smaller stones than a Flavus. So there was some competition with some of them. But there always has been this competition.

INTERVIEWER: I wanted to think of a question for a moment. I'll turn this off.